The Goldilocks Enigma
Paul Davies

The Goldilocks Enigma has a progression that is typical of late of physicists writing books for us common people. That progression is from physics to metaphysics to theology to mysticism to nonsense. It would be nice if authors would divide their works into sections so that one would know what to read and to leave unread. They don't, so I will look at the book as a whole and give comments where comments are needed.

I have mentioned it before elsewhere, but will again. It would seem that the expansion of the universe is the same everywhere. It is not just expanding out there. It is expanding here also. If that is the cast then the universe is expanding between say the earth and the sun. Gravity would fight against this expansion. If the distance between the earth and the sun does not change then gravity has to have a slightly greater force than we measure since the expansion is not taken into account. I am sure I am confused about this. Questions like this should be addressed but never are. It is not clear to readers of such books as to how small a scale this expansion is taking place.

When things cooled down to when electrons could be formed, why electrons? I know an electromagnetic wave if energetic enough can form an electron and a positron. Electromagnetic waves are produced by accelerating charged particles. If there were no charged particles where did the electromagnetic waves come from? Maybe what is confusing is where did the products of the bang come from?

One hears of a big bang and an expansion. When something expands it either expands against a resistance until it is overcome or it expands until it meets a resistance and is overcome such as filling a container. Is "bang" and "expand" the wrong words to use? Are those of us who trod only the lower hills of the science world being mislead? Such questions and others need clarity. Instead things get more bizarre.

String theory seems very contrived. It is as if mathematicians who should be locked up in Area 51 and never let out in public are making a mold of reality and claiming it is reality. It is like listening to Maxwell Smart

finally ask, “Would you believe three dimensions and pepperoni rolled up in a pizza? “

In the chapter “Does a Multiverse Solve the Goldilocks Enigma?” is the statement “There is no fundamental reason why life couldn’t use left-handed DNA”. That statement does not cut it logically. There is reason to believe there is a fundamental reason, at least at my level of knowledge. As soon as the earth was able to sustain life, life either was so created or formed naturally. Let us say it formed naturally and then evolved, which is the most accepted explanation. It formed so quickly after conditions were just right, it is hard to believe it only did so in one place. Either it formed in one place and spread so quickly that it sucked up all the material necessary for formation of any new life, or it formed in many places. If in many places then either there is some fundamental reason that it must be right-handed, or there were just as many pockets of right-handed and left-handed life. If just as many pockets of either then one destroyed the other. Why is life right handed?

Davies states in the chapter on Multiverse that “A universe in which the electromagnetic force is, say, 1 percent stronger would probably still be habitable.” Why probably? If the mathematical understanding of reality is so strong, why not make the force 1 percent stronger in the necessary equations, crunch the numbers and see what comes out. For example, what would be the properties of water if the electromagnetic force were 1 percent stronger? Water is a small molecule of only 3 atoms. Surely, the freezing and melting points of the new water can be calculated. How different are they from real water. If the properties of the new water cannot be determined then the mathematical model cannot tell the properties of real water. Those properties are then known only from experiment and the math is pasted on. Then what should one make of the mathematical model.

The multiverse is either a motherverse that spawns universes or a collection of universes that spawn out new universes. In either case the multiverse in infinite. The question is, if something infinite creates new entities, at what rate does it create them? It seems that the rate would have to be infinite. It would also seem that in relation to time the multiverse would be a fractal. It would change but look the same at any time in the past or in the future. Past and future have no meaning. It may also be necessary that the multiverse be of infinite dimension.

In the chapter “Does a Multiverse Solve the Goldilocks Enigma” Davies goes through a contortion concerning dark energy that would tear the sinews of any normal man. I am not too sure that I can even comment on it without a Costco size bottle of Ibuprofen. I will try. The argument goes that the “natural” value for dark energy is 120 powers greater than the observed value. As Davies put it this is not the natural value but the “natural” value. Why the quotation marks is not clear and Davies did not explain why. Since the observed value, and I use that loosely, is so much smaller than the “natural” value, if there is only a small range of values for which life could develop the multiverse theory can be disproved. Any theory that can be proved or disproved is scientific. Thus, the multiverse theory is scientific. In the old days any theory that was several powers off from what was observed, let alone 120 powers off, would be highly questioned. Did George Orwell speak of New Science along with New Speak and New History?

In the section “Have Varying ‘Constants’ Already Been Detected” Davis states “Clearly, if the laws can change slightly within the observed universe, they can change a lot in the regions beyond.” The problem with walking the mountain tops of the science world is that sometimes one is walking in the clouds. One then has to strain to see what they think they see clearly. What are these “regions beyond” he sees so clearly? Davies then says “… the multiverse is not wholly speculative. It is rooted in respectable science…” How much of something has to be non-speculative for it to be rooted in respectable science. It would seem not much. One must conclude that respectable science has lost a little sheen.

In the section “Laws by Design Verses Anthropic Selection in a Multiverse” one finds themselves in the theological progression of the book. One has to tread carefully on the high altitude precipices Davies walks. Davies talks of a god who he characterizes as a “designer-creator”. He explains that an intelligent god designs the laws of nature from which all that we see and experience are derived and related to. That god can design, build and windup the universe and go on vacation, returning later to see how things went. The unintelligent god is one who has to constantly watch over creation and tinker with it to keep it going the way he wants. Having read the Bible and from what I have learned from my Christian friends, the God of the Jews and Christians is an unintelligent god by Davies’ definition. What Davies lacks an understanding of is that for Jews and Christians the focus is not the nature of creation, it is the purpose. The

problem is that when Davies talks of god or “intelligent designer” or “creator-designer” one immediately thinks of the God of the bible. But that is not what Davies means at all. The advent of quantum mechanics brought eastern mysticism into physics. When physicists delve into theology one must keep in mind it is eastern theology they are delving into. Not liking to mix theology with my reading of physics unless that is the purpose of the book and the reason I purchased it, Davies comments while meaningful in the context of the progression of such books, were meaningless to me.

In the section “Mathematics and Physics Emerge as One” Davies says “But taking the informational view described in the foregoing sections, in which mathematics is tied to the physical world even as the physical world is tied to mathematical laws, offers the hope of complete unification.” Anyone for which this has any meaning has been up too high on the mountain tops too long and is oxygen deprived. If mathematics and the physical world emerge as one, whatever that means, there are certain criterions that must be met. The property of matter to form into life must fall within mathematics. As of now there is not the slightest hint within all of mathematics and physics that such is the case. It is possible that matter forming into life is outside of science, i.e. cannot be explained by mathematics. The property of matter to form into life may be within physical science, but too difficult for man to describe mathematically. Either case has to be proved to be the accepted one. There is another criterion. For physics and mathematics to emerge as one, all solutions to a mathematical formulation of something within the physical world must be realized in the physical world. If there are solutions that are not realized in the physical world then that mathematical formulation must be considered as incorrect if the goal is to merge mathematics and physics as one, again whatever that means.

Many assumptions are made, but not made clear that they are assumptions. One is that everything we observe in the universe can be put into mathematical form. As I said above life may not be so put. It must be proved otherwise. Another assumption is that in the multiverse hypothesis each new universe would have a different set of physical laws. Why should that be? Why not one physics pertaining to the multiverse? It is assumed that at the moment, whatever that means, of the big bang a direction was taken, using “direction” in its most abstract meaning, that formed the laws of physics. There is no reason to think this. The formation of the so called moment is beyond understanding let alone the formation of physical laws.

Davies seems to have GFS – God Frustration Syndrome. He either tries to place his vague idea of God into creation or expand creation to hold his vague idea of God. It seems many physicists cannot comprehend the abstraction of the God most of my Christian friends accept, and instead have more a concept of an Eastern mystical god - not only an Eastern mystical god, but one that is a physicist. I do not care to read anymore of Mr. Davies frustrations about God. I do not care to read anymore of any physicist's frustrations about God. This is likely the last modern book of physics for the common man that I will read. Indeed, in does seem that physics has come to an end or at best a barrier. There seems to be nothing new to be said and the void is filled with metaphysics and theology and mysticism and nonsense.

Mr. Davies, and many others, should take a clue from the most intelligent American of them all, Popeye the Sailor Man, when he said "I knows what I knows and that's all that I knows." Using such a philosophy Davies book "The Goldilocks Enigma" would be less than half the size it is.

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